

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TRAVIS D. FOX,
EDWIN S. OLDS, MARK A. GAERTNER,
and ABBAS ALI

Appeal 2007-3341
Application 10/602,254¹
Technology Center 2100

Decided: November 27, 2007

Before KENNETH W. HAIRSTON, LEE E. BARRETT, and
ROBERT E. NAPPI, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

DECISION ON APPEAL

1This is a decision on appeal under 35 U.S.C. § 134(a) from the final rejection of claims 1-13 and 21-28. We have jurisdiction pursuant to 35 U.S.C. § 6(b).

We reverse.

BACKGROUND

¹ Application for patent filed June 23, 2003, entitled "Adaptive Extension of Speculative Data Acquisition for a Data Storage Device," which claims the benefit of Provisional Application 60/423,102, filed November 1, 2002.

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The claims are directed to a method for transferring speculative data.
See Summary of Claimed Subject Matter (App. Br. 3-7).

Claim 1 is illustrative:

1. A method comprising the steps of executing a first data transfer command, and delaying execution of a second data transfer command to transfer speculative data in lieu thereof.

THE REFERENCES

Furuumi	US 2002/0052985A1	May 2, 2002
Olds	US 2003/0105919A1	June 5, 2003
		(filed May 10, 2002)

Jim Handy, *The Cache Memory Book* (Academic Press 1993),
pages 5-8 and 64-84.

THE REJECTIONS²

Claims 1-13 and 21-28 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Olds.³

Claims 1 and 25 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Furuumi and Handy.

² The rejection of claims 1-13 and 25-28 under 35 U.S.C. § 112, first paragraph, for lack of written description is withdrawn (Ans. 3). The rejection of claim 21 under 35 U.S.C. § 103(a) over Furuumi and Handy is withdrawn (Ans. 3-4).

³ The statement of the rejection only refers to claims 1, 21, and 25 (Ans. 4). We assume this is an oversight since the Final Rejection refers to claims 1-13 and 21-28.

DISCUSSION

Anticipation

Claims 1-13 and 25-28

Appellants argue that Olds does not disclose "delaying execution of a second data transfer command to transfer speculative data in lieu thereof" in claim 1 and "to delay execution of a second data transfer command to transfer speculative data in lieu thereof" in claim 25. In particular, Appellants argue that the Examiner erred in finding that delaying initiating a "seek" is part of executing a data transfer command because the written description makes a clear distinction between "execution" of a command and the "access time" between the commands, which includes the "seek time," "set-up time," and a "latency period" (App. Br. 12-14; Reply Br. 2-3). It is argued that Olds also distinguishes between "execution" of commands and the intervening "access time" between commands in the same way (App. Br. 14).

The Examiner maintains that since a command input must have been issued in order to carry out the seek, this must be included in the "second data transfer command" (Ans. 12).

Appellants reply that the fact that some sort of servo command may have been issued to carry out the seek prior to the execution of a data transfer command does not cause that servo command to become part of the "second data transfer command," particularly when the written description explicitly states otherwise (Reply Br. 4).

We agree with Appellants. The DATA 1 block 150 and the DATA 2 block 154 in Olds are described as read commands (¶ 0050), which are separate from the overhead 158, seek 160, and latency 162 times. Execution of the commands causes data to be read or written. Appellants' specification expressly discloses that the "access time" is an amount of time between completion of an access command and a subsequent execution of a next scheduled access command where the access time includes a seek time, a set-up time, and a latency period (Specification 7, ll. 3-7). Claims must be interpreted in light of the specification. Thus, execution of a data transfer command is the actual transfer to or from the disk and does not include the access time, including the seek time. Olds does not delay execution of the second data transfer command DATA 2 since it begins and ends at the same time. Therefore, the rejection of claims 1 and 25, and their dependent claims 2-13 and 26-28, is reversed.

Claims 21-24

Appellants argue that Olds does not disclose "transferring speculative data instead of second data associated with a second pending command during a next available latency period for the second command," as recited in claim 21 (App. Br. 18-19). This limitation is comparable in scope to the limitation in claim 1, which has already been discussed. The rejection of claim 21 and its dependent claims 22-24 is reversed.

Appellants also argue that Olds is silent with regard to adjudging any utility of speculative data in view of a utility of requested data, much less

operating "when the speculative data are adjudge as having a utility greater than a utility of the second data," as recited in claim 21 (App. Br. 19). The rejection does not address this limitation. Thus, the rejection of claim 21 and its dependent claims 22-24 is reversed for this additional reason.

Obviousness

The rejection only includes independent claims 1 and 25.

The Examiner finds that Furuumi discloses delaying execution of a second data transfer command to transfer data (referring to ¶¶ 0061, 0068), but does not disclose transferring speculative data (Ans. 7). The Examiner finds that Handy discloses transferring speculative data (Ans. 8). The Examiner concludes that one of ordinary skill in the art would have been motivated to incorporate speculative data as taught by Handy into the system of Furuumi because it would increase system access speed (Ans. 8).

Appellants argue that Furuumi's staging of completion reports has nothing to do with, and cannot be viewed as, teaching or suggesting delaying execution of a second data transfer command to transfer data in lieu thereof, irrespective of whether the data are speculative or not (App. Br. 20). It is argued that Furuumi teaches to stage commands on a physical drive basis, so that processing of specific command chains (CCWs) may be completed (and subsequently executed) in an order different than the order in which the CCW chains were submitted for processing (App. Br. 20-21). CCWs are subjected to stage processing only if a cache miss occurs (i.e., the data are not already in the cache) (App. Br. 21). It is further argued that Handy only

discloses that automated pre-fetching may take place in the absence of a pending command and does not teach or suggest "delaying execution of a second data transfer command to transfer speculative data in lieu thereof," as claimed (App. Br. 22).

The Examiner discusses that "since the command processing [in Furuumi] is performed in the order that staging is completed not in the order received from the processor, execution of some commands from the processor could be delayed in order to transfer data . . . in lieu thereof" (Ans. 16). The Examiner repeats that it would have been obvious to incorporate speculative data as taught by Handy into the system of Furuumi because it would increase system access speed (Ans. 17).

Furuumi discloses that to execute an input/output (I/O) request to a storage unit, the central processing unit (CPU) creates a command group consisting of plural commands and data called a CCW chain (¶ 0004). When a read/write command is issued from the CPU to a storage unit under control of a storage control unit, if target data does not exist in a cache memory within the storage control unit, the data must be staged to the cache memory, in which case the storage control unit cannot immediately execute the command (¶ 0011). Furuumi discloses a method for reducing response time due to a cache miss (¶ 0014). Without getting into all the details, Figure 1 of Furuumi shows a series of commands CCW1, CCW2, and CCW3. Target data for CCW1 and CCW2 are not found in the cache (cache misses), so staging requests 2010 and 2011 are issued for data on the

physical drives. Target data for CCW3 is found in the cache (cache hit) and data 104 is returned to the CPU. When data is retrieved from the physical drives to the cache for the staging requests 2010 and 2011, staging completion notices 2012 and 2013, respectively, are issued and data 105 and 106 are then transferred to the CPU.

While Furuumi shows that commands are not completed in the order that commands are sent, e.g., command CCW1 is delayed by the time necessary to execute staging requests for CCW1 and CCW2, and transfer of data for CCW3, so that CCW2 completes before CCW1 or CCW2. This is due to the fact that target data is not found in the cache, but must be retrieved from the physical drive. There is no indication or suggestion of "delaying execution of a second data transfer command to transfer speculative data in lieu thereof" and there is no reason to provide for transferring of speculative data. Speculative data is taught by Handy (and by Olds), so this is not the invention. The invention is in the delaying of execution of a second command to transfer data. This is not taught or suggested in the combination of Furuumi and Handy. The obviousness rejection of claims 1 and 25 is reversed.

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CONCLUSION

The rejections of claims 1-13 and 21-28 are reversed.

REVERSED

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Fellers, Snider, Blankenship,
Bailey & Tippens, P.C.
Bank One Tower
100 North Broadway, Suite 1700
Oklahoma City, OK 73102-8820